

STUDY ON EFFECT OF CHENNAI METRO RAIL LIMITED ROUTING SYSTEM AND ITS FUTURE GROWTH

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ABSTRACT

In the present scenario due to machine life and modern development, publics are more dependent on latest navigation system of metro rail. Such system works well to groom their lifestyle and helps them to reach their destination on time. In this research, an attempt was made to focus on future of Chennai metro rail limited and its future development along with the parallel growth of metros that boost people's life style at metros. The factors that support Chennai metro rail limited project are addressed with the overall impact of it for an area grows with before and after the impact of the projects. This research article also addressed the innovative growth of area about how nearby areas are deeply enjoying the impact of such project by knowing the overall outcome of the project. The development of the project is also addressed with all the necessary growth factors which support the lifestyle of the general public.

KEYWORDS: Chennai City, Transport, CMRL, Passenger Lifestyle & Reliability

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INTRODUCTION

Metro cities are a matrix of functions and activity and at the wheel of this activity is quality. Since the cities grew in numbers, the requirement for travelling a lot of folks conjointly grew. There has been a major transformation within the urban transport sector in the urban centre, from its earlier dependency on waterways to its current mode of rail and road transport. Since the urban infrastructure and governance program underneath solon Jawaharlal Nehru National Urban Renewal Mission has enabled cities to upgrade their conveyance systems, the aspiration of state and town governments has broadened to form a world category transport infrastructure birthing hopes for a contemporary metro/ monorail. Kolkata was the primary town within the country to possess associate in nursing underground railway system rail primarily as a result of lack of adequate roads and congestion related to the road transport. The holdup in an urban centre as a result of sizable amount of personal vehicles particularly cars and therefore the increasing pollution forced the town to speculate within the railway system. The sure-fire running of urban centre railway system of Delhi Metro Rail Corporation (DMRC) has currently impressed different metropolitan cities like Bangalore, Chennai, Hyderabad and Ahmedabad to pursue this mode of conveyance. The option of those new conveyance systems of bus public transit system (BRTS), mono rail and railway system rail has given multiple selections to the cities. These choices are obtainable for a few times, however the cities are adopting it solely currently as a result of easy accessibility to finance, faster method process, target urban areas and international move towards public transportation. In this research, we made an attempt to

focus on the present futures and growth oh CMRL to enhance the passengers' reliability and safety.

CMRL Transport Matrix

Chennai city is the fourth largest town within India with over eight million population and a density of over twenty five individuals per square metric linear unit [1-2]. It's an expensive colonial fine arts history besides the native heritage buildings and a reworking skyline. The city is termed the urban centre of the east, because it is home to several leading automobile manufacturing industries of the country. Since the knowledge Information Technology (IT) revolution, it's becoming a favoured destination for education and opportunities that has resulted within the high rate of growth. Chennai city is ecologically sensitive, because it contains the parkland at Guindy, marshes at Pallikaranai, rocky hillocks and water bodies like adyar water, buckingham canal, coovum stream that area unit apace disappearing attributable to intense land pressure. The city contains a sensible network of transport with bus and train. The metropolitan transport corporation (MTC) provides the bus transport with about 3465 fleets plying on 732 routes carrying over five million passengers per day [3-5]. The community train and also the mass rapid transit system (MRTS) network links the city's centre with its fringe and carries roughly one million passengers per day [6, 7]. As per the state transport authority records there is a unit regarding three million registered vehicles in an urban centre as of April 2014 of that over 2.5 million area unit of two wheelers [8]. Attributable to the troubled growth of personal vehicles and slim roads of town the congestion has enhanced and also the volume to the capability quantitative relation of roads has enhanced to 12 times [9]. Figure 1 indicates that transport makes up for a bit over twenty eighth of the travelling within the city, whereas nearly 33% of the passengers are being created by walk. Considering the increasing fuel price and traffic congestion, the shift in rider-ship is anticipated to happen in close to future, provided the government takes tight steps to scale back the quantity of personal vehicles on the road. To attract a lot of rider-ships, the mode of transport should be systematically reliable, accessible, safe, price effective and equipped with facilities keeping the longer term in mind [11-14].

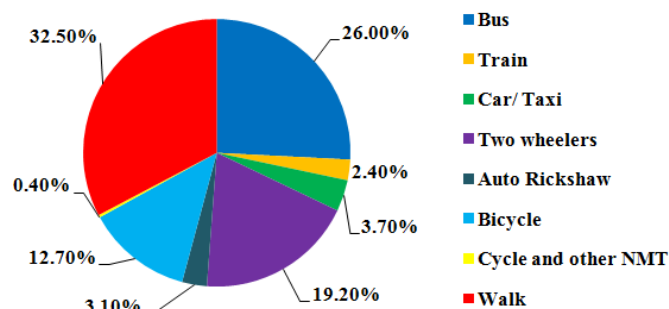


Figure 1: City Travel Mode-Trip Fragment

(Source: Harvard Humanitarian Initiative Survey of the Detailed Project Report for the Chennai Metro Rail Project, 2005)

CMRL Transport Integration Systems

The government authorities might rationalize on the quality of the mode supported, the price to learn analysis and also the growth policies and methods for the city with the arrival of latest and fashionable transport systems. Though the town has the requisite density for all the three modes, alternative parameters like road dimension, land acquisitions, political can, forms and policies creates discrepancies in creating selections which might optimize the density and potential users. Transient comparison of the BRTS, railway system and mono rail is given in Table1. The transport infrastructure in

most of the cities in India is the associate degree afterthought of the designed surroundings that is poorly documented. With the formation of unified metropolitan transport authority in Chennai, a step towards integration of varied transport bodies is in progress [15]. They're the broadest roads within the town that receives serious traffic besides the government additionally has adequate land on these roads, hence a rational call to speculate within the railway system was taken. Besides railway system, the new government has additionally projected 111 metric linear unit stretch of monorail for the primary part that deliberation on its viability is ongoing [16].

Table 1: BRTS, Metro and Mono Rail-Comparative Study

Sl. No	Parameters	BRTS	Metro	Mono
1	Infrastructure Capital Cost (Crores /km)	10- Ahmedabad- 8.5 Cr in phase 1 and 15 Cr in phase 2	150- In Chennai's context the elevated route costs 100 Cr the underground costs 300 Cr	100
2	Carrying Capacity (peak hour peak direction traffic)	10,000 to 18,000	Min- 30,000 to Max- 60,000	3000 - 10000
3	Population Density (People per sqkm)	4,000-5,000	8,000-10,000	4,000 -5,000
4	Population of the city (in millions)	2-2.5	6 - 6.5	2 - 2.5
5	Average speed (Kmph)	27	38	30
6	Average Station Distance (Km)	0.5 - 0.7	1.25 - 2	0.75- 1
7	Average Headway	1.5 - 5.2	1.5 - 3	5 - 8.5
8	Vehicle capacity	80 (1)	700 (4 compartments)	100
9	Usage	Limited CBD but good urban coverage	CBD to Urban Centres	Ltd
10	Right of Way required in (m)	6 to 7	12 to 25	6

(Source: Based on the regression analysis done by using data from 80 cities in the world by Centre for Environmental Planning and Technology (CEPT) Ahmedabad [17, 18])

Chennai metro rail limited (CMRL) may be a special purpose vehicle during which each state and therefore the central government have equal stakes which entirely amounts to four-hundredth of the price. The remainder of the cash is being generated by a loan from the Japan Bank for International Cooperation for a 33 year long reimbursement amount. The Chennai railway line route is split into a pair of corridors connecting the gateways of town such as railway stations, moffusil bus terminus and airport along and stretches to a 44 kilometres network. There are 25 stations planned of that 17 are elevated and therefore the rest are underground. The full value of building the railway line is calculable at Rs14500 large integer. The rider-ship supported the traffic modelling for the year of 2016 is calculable to hold 7, 00,000 folks that at 5.4% would grow to 1.24 million by 2026. Figure 2 shows the railway line and community train routes cross at sure stations. A clearer image of the general public transport network would emerge by overlaying the itinerary on this map. As ascertained within the success of the urban centre, railway line and therefore the failure of MRTS in Chennai accessibility hold the key to success of any transport system. S the footpaths encompassing the railway line station should be broad and well maintained to accommodate multi-modal shifts. The feeder bus services should even be expedited close to the stations.



(Source: CMRL Map: courtesy www.transparentchennai.com)

Figure 2: Metro Route Chart Overlaid with Suburban Train Route

CMRL Causes of Concerns

- The project is categorized beneath the railroad sector that environmental impact assessment is not obligatory in the Asian nation. However, because the loaning agency Japan Bank for International Cooperation had insisted on having tips compliant with the surroundings and social issues, associate degree environmental impact assessment report was ready in 2008.
- Several trees and neighborhood parks are demolished right down to the ground and there has been no public consultation on that. Though CMRL has assured to plant 10 trees for each tree cut, however a number of the environmental activists have raised valid arguments concerning the amendment this may cause on the chill climate of the areas. As most trees are being cut in the area unit and area unit grownup, it will take a few years for the new saplings to switch the inexperienced cowl. Besides the planting won't occur within the locations from wherever the trees are uprooted making imbalance within the encompassing surroundings. The tunnelling for underground railway could have an effect on the bottom water recharge of the world which could cause lowering of the bottom geological formation.
- Chennai has many water bodies and because the railway route crosses each Coovum and Adyar stream doubly it's necessary to have requisite precautions. The railway property from park city to government estate is underground and as a little stretch of this tunnel goes below the Coovum stream, which could have an effect on its flow and cause floods throughout incessant rains.
- The railway primarily plies on 3 major blood vessel roads of city specifically central monetary unit Salai, GST road, EVR periyar boswellia serrata and also the inner route. There are four residential area unit stations simply off the EVR periyar boswellia serrata specifically Chetpet, Egmore, Park and Fort and other six stations that area unit running parallel to the central monetary unit salai, GST road specifically Chintadripet, Saidapet, Guindy, St. Thomas mount, Pazavanthangal, Tirusulam. These stations don't seem to be accustomed their limits primarily as a result of lack of correct access to the blood vessel roads. The residential area railroad station has hidden access through slender and unsafe roads. These stations conjointly lack visual, transit and physical property to the blood vessel roads on that the railway is planned. Table 2 shows the details of routes and distance where the metro rail

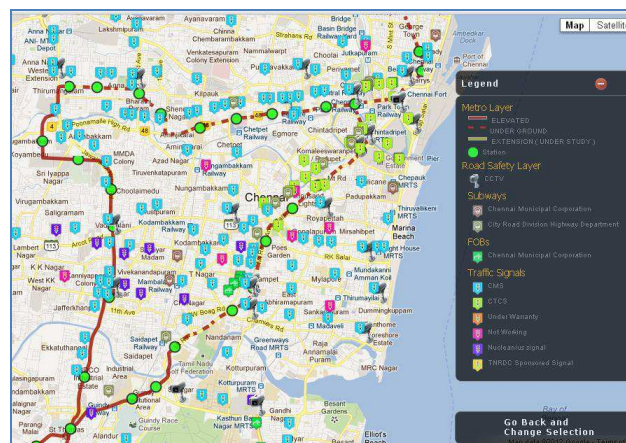
system is running parallel to suburban train, where the stations are spaced less than one km away from each other.

Table 1: Routes and Distance of the Metro Running Parallel to Suburban Train

From	To	Approximate Distance (km)
Chetpet	Fort	4.4
Park	Chintadripet	1.2
Saidapet	Guindy	3.5
St. Thomas Mount	Tirusulam	4.3
Total distance		13.4

Parameters to be Considered While Planning the MRL

Pedestrian and Feeder Linkages: Figure 3 indicates the subways, foot over bridges, traffic signals and Closed-Circuit Television (CCTV) cameras which are basically used for safekeeping of commuters on busy roads. Inner route has no subways and foot over bridges for the variety of recorded accidents within the town.



(Source Map: www.transparentchennai.com)

Figure 3: Pedestrians Road Safety Layer in City

Integration of Transport Network: The transition from railway lines to different modes of transport must be sleek. The buses should act as a feeder service to the railway line and therefore the frequency must be matched to synchronize with the railway line train timings. The buses plying on the railway line route could be reduced in order that the second mode adds harmony while not poignant every other's ridership. There should be an adequate car parking zone. The parking of personal vehicles could be regulated, because it occupies precious public space.

Laws and Standards: The railway line rail should upgrade the quality of service. It could additionally take necessary precautions to make sure safety and security of the passengers and its property. The advertising rights, lighting on the encircling streets, operation and maintenance of the stations and therefore the surroundings could be standardized and controlled by the operator. The Chennai metropolitan development authority and CMRL should co-ordinate between themselves to control the designed house within the surroundings.

Urban Style and Coming up with Issues: While coming up with a transport infrastructure in an exceedingly designed house may be a tough proposition, holding the integrity of urban atmosphere is more durable. It is necessary to review the social and economic fragments the transport infrastructure which would cause within the lives of the residents. It is good to consult the voters of the town in an exceedingly massive public forum and contemplate the deliberation within

the legal process. Public participation can guarantee higher possession of the project associates and facilitate in creating an inclusive project.

CONCLUSIONS

In this study, features of CMRL and future growth for the extension of new line are discussed. From the results, the following observations were made.

- The metro cities are always in a constant mode of transition and it is necessary that the confusion is put in order. Metro system being a successful model of public transport in Delhi has become the pride of the country.
- It is also important to note that in many other parts of the world, the metro has failed to recover investments and thus the government should study the cause of its failure so as to not repeat any of this while making the metro in their cities.
- The city is looking forward to revitalize its stagnant and rethink its future of transport, but at the same time it must understand that metro is a long term investment and the benefits will accrue over a period of time.
- All the above concerns and deliberations have emerged in this study are in the context of Chennai but are applicable anywhere in the world.
- As the country is rapidly urbanizing, mass public transport will be the mainstay of cities having five million plus population, whereas the investment in metro should be made keeping in mind for future growth.

REFERENCES

1. <http://www.thehindu.com/news/cities/Chennai/article1095610.ece>
2. Anbalagan, V., Nallusamy, S. and Kumar, P. (2007). *Performance evaluation of metropolitan transport corporations in India. Indian Journal of Transport Management*, 31(2), 103-121.
3. <http://www.mtcbus.org/>
4. Nallusamy, S., Bijan Sarkar, Gautam Majumdar and Anbalagan, V. (2006). *Failure mode effect analysis for refurbished buses in state transport undertaking. Indian Journal of Transport Management*, 30(2), 205-222.
5. Nallusamy, S. (2016). *A proposed model for lead time reduction during maintenance of public passenger transport vehicles. International Journal of Engineering Research in Africa*, 23, 174-180.
6. <http://businesstoday.intoday.in/story/mass-rejected-transit-system/1/5396.html>
7. <http://www.hindu.com/op/2005/03/15/stories/2005031500251900.htm>
8. <http://www.tn.gov.in/sta/g3.pdf>
9. <http://www.thehindu.com/news/cities/Chennai/article2160763.ece>
10. Data received through RTI dated April 2011.
11. <http://www.hindu.com/2009/05/25/stories/2009052558710400.htm>
12. Nallusamy, S., Balakannan, K., Chakraborty, P.S. and Gautam Majumdar. (2015). *Reliability analysis of passenger transport vehicles in public sector undertaking. International Journal of Applied Engineering Research*, 10(68), 843-850.

13. Nallusamy, S., Dinagaraj, G.B., Balakannan, K. and Satheesh, S. (2015). Sustainable green lean manufacturing practices in small scale industries-A case study. *International Journal of Applied Engineering Research*, 10(62), 143-146.
14. Nallusamy, S., Manikanda Prabu, N., Balakannan, K. and Gautam Majumdar. (2015). Analysis of static stress in an alloy wheel of the passenger car. *International Journal of Engineering Research in Africa*, 16, 17-25.
15. Kesari V & Murtaza Ma, Effect of Add-on and Surface Finish on Aerodynamic Drag of a Passenger Car, *International Journal of Automobile Engineering Research and Development (IJAERD)*, Volume 5, Issue 2, July - August 2015, pp. 1-6
16. <http://www.thehindu.com/news/cities/chennai/article2920973.ece>
17. Balakannan, K., Nallusamy, S., Chakraborty, P.S. and Gautam Majumdar. (2016). Performance evaluation of supply chain and logistics management system for efficiency enhancement of automotive industries in India. *Indian Journal of Science and Technology*, 9(35), 01-09.
18. <http://www.niua.org/projects/tpt/AHMEDABAD%20BRTS.pdf>
19. <http://chennaiemtorail.gov.in/brief.php>

